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LONGEVITY IN PEROMYSCUS

By F. B. SUMNER

Various writers have doubtless recorded observations bearing upon the longevity of rats and mice, but very few of these have come to my notice. No careful search for such records seems profitable, however, in connection with the publication of the following brief notes of my own. I shall therefore proceed without making any extensive display of references to "the literature," and shall ask the indulgence of those whose publications I have overlooked. It is worth mentioning that I find rather wide differences among the estimates which lie at hand. Weismann, in his well-known essay on "The Duration of Life" states that a "mouse" (presumably he means a house-mouse) lives six years, while the anonymous author of the booklet "Fancy Mice" assures us that, if properly cared for, mice "will live for two or three years, and then die of old age." The white rat, according to the extensive observations of Donaldson and his co-workers, is to be regarded as very old at the age of three years (i.e., comparable with a man of 90), while the female commonly becomes sterile at the age of 15 to 18 months.

With deer-mice, as in the case of most wild animals, there would seem to be no way of testing the natural span of life, except by rearing them in captivity, from birth until the time when they finally succumb to "old age." The period thus measured doubtless does not fairly represent the average life cycle in nature. On the one hand, the conditions of captivity, as I have more than once pointed out, do not make for normal development on the part of all individuals. Sterility, stunting and even deformity, may be the result of these artificial conditions. In the mouse's favor, on the other hand, is the fact that it is protected and fed throughout life, a circumstance which is of particular importance during the period of old age. Thus, several of the mice referred to below became extremely feeble many months before death occurred. Such animals would doubtless have died or been killed much earlier in a state of nature.

In September, 1916, ten mice (five of each sex) were selected from the first cage-bred generation of *Peromyscus maniculatus gambeli*, belonging to the local (La Jolla) strain. These mice were, at this time, about a year old. They were normal, healthy specimens, but not otherwise exceptional. Two of these animals met with an accidental death, when more than two years old; another met with a

presumably "natural" death at a date which was unfortunately not recorded. This mouse is known, however, to have reached an age of at least 3 years and 2 months.

The remaining seven individuals died at the following ages:

♀ 71.....	3 years, 0	months
♂ 20.....	3	" 4 (+) "
♀ 11.....	4	" 2 "
♂ 39.....	4	" 5 "
♀ 81.....	4	" 8 (+) "
♀ 2.....	5	" 3 (-) "
♀ 22.....	5	" 8 (-) "

Thus, five of these mice attained an age of more than four years, while two attained an age of more than five years. The patriarch (or rather, *matriarch*) among them reached the ripe age of 5 years and 8 months.

In all of these seven cases, death resulted from disease or "old age." Several of the mice became extremely senile and "wobbly" long before death occurred, and it was noted that several of them were very much affected by cold. Such individuals became numb and feeble on cold days, and it is perhaps significant that five of the deaths occurred during the winter or late fall.

No obvious changes occurred in the appearance of the senile pelages, though the two oldest of these have been saved for more careful study. It is worth noting that of the two which died in the sixth year one was dark and the other somewhat buff, representing the normal range of variation in adult individuals of this subspecies. It was noticed that one of the males, in middle or late life, acquired a curious "grizzled" appearance in the hair of the face, giving him a decidedly venerable appearance. I found, however, that this was a hereditary peculiarity of the family to which the grizzled mouse belonged. It was noted in at least four other individuals, in some cases while the animals were still young.

Unfortunately, my records, as regards the fertility of this "old age" stock, are very meagre. At the commencement of the experiment, all were mated, except one male, which was kept apart until he was nearly three years old, and then mated. No record was kept of the earlier broods resulting from these matings. It is probable that some of the individuals were sterile from the outset, a condition not infrequent among cage-bred *Peromyscus*.

My few positive results bearing on the duration of the reproductive period are as follows. One pair (♀ 2 and ♂ 21) produced a brood of five or six young, when at the age of 31 months. Two of these reached the age of 4 months and were then killed. The father met an accidental death not long after, and the mother was mated to ♂ 20, whose fertility was unknown. No further broods resulted.

Another pair (♀ 81 and ♂ 39) produced one brood at the age of 33 months, and another when more than 34 months old. They were remated about 5 months after the birth of this last brood, but no further young were produced, though these mice lived together for more than a year. The two broods referred to contained but two individuals each, and of these four only two reached the age of two weeks. From these facts and those mentioned in the preceding paragraph, it seems possible that the offspring of parents of this age tend to be weak. But such sickly broods may be born to parents at any time of life, and the results here cited may have no relation to the age of the parents.

Females 2 and 22, when nearly five years old, were mated to a fertile male of another lot, but no young resulted, as might have been confidently expected.

A record for two other mice of my stock is worth reporting here. The pair in question were wild ones, whose age, at the time of trapping, was of course unknown, though they were probably at least several months old at the time. Their last brood was born very nearly three years later.

The salient facts in the foregoing discussion seem to be that one mouse of the subspecies *Peromyscus maniculatus gambeli* is known to have reached the age of five years and eight months in captivity, while two pairs are known to have produced young when both parents were nearly or quite three years old.

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